CLAIMS

1. An electron tube (1) comprising:

an envelope (2) formed with a photocathode (11) at a predetermined part of the internal surface thereof;

a fixing plate (80) which is disposed in the envelope (2) and which has a central position and a outer periphery (87b) surrounding the central position;

an electron-bombarded semiconductor device (15) which is fixed to the central position of the fixing plate (80) and which faces the photocathode (11);

a first tubular wall (72) which is fixed to a position between the central position and the outer periphery (87b) of the fixing plate (80), the first tubular wall (72) surrounding the semiconductor device (15) and extending toward the photocathode (11); and

an evaporation source (17, 19) generating metal vapor, the evaporation source (17, 19) being disposed inside the envelope (2) on the photocathode (11) side relative to the fixing plate (80) and being disposed at a position between the first tubular wall (72) and an imaginary-extended-curved-surface (M) of the outer periphery (87b) of the fixing plate (80) that extends toward the photocathode (11), the semiconductor device (15) detecting photoelectrons emitted from the photocathode (11) in response to an incident light thereon.

2. The electron tube (1) as claimed in Claim 1, further comprising an insulating tube (9) having one end and another end, the another end being connected to the envelope (2) and the one end protruding inside the envelope (2),

wherein the fixing plate (80) and the evaporation source (17, 19) are disposed on the one end of the insulating tube (9).

3. The electron tube (1) as claimed in any one of Claims 1 to 2,

wherein the envelope (2) includes

a cylindrical base (5); and

a main body (4) having a first main body (4a) that is curved substantially in a spherical shape and a second main body (4b) that is curved substantially in a spherical shape and that connects the first main body (4a) to the base (5); and

wherein the semiconductor device (15) is disposed on the main body (4) side relative to an intersection (S) between an axis (Z) of the base (5) and an imaginary extended surface (I) of the second main body (4b) that is located inside the base (5).

4. The electron tube (1) as claimed in any one of Claims 2 to 3,

wherein the another end of the tube (9) is connected to the envelope (2) and the one end of the tube (9)

protrudes inside the main body (4) of the envelope (2), and

wherein the fixing plate (80) and the evaporation source (17, 19) are disposed on the one end of the tube (9).

5. The electron tube (1) as claimed in any one of Claims 2 to 4, further comprising a conductive member (21) provided on the one end of the tube (9) and protruding outside the tube (9) to reduce the field intensity in the vicinity of the one end of the tube (9),

wherein the fixing plate (80) includes an inner stem (80) that is connected to the one end of the tube (9) via a conductive member (89).

6. The electron tube (1) as claimed in any one of Claims 2 to 4, further comprising a conductive member (23) provided on the another end of the tube (9) and protruding outside the tube (9) to reduce the field intensity in the vicinity of the another end of the tube (9),

wherein the envelope (2) includes an outer stem (6) connected to the another end of the tube (9), at least a part of the outer stem (6) that is connected to the another end of the tube (9) being conductive.

7. An electron tube (1) comprising:

an envelope (2) formed with a photocathode (11) in a predetermined part of an internal surface thereof;

an electron-bombarded semiconductor device (15) provided inside the envelope (2);

a first tubular wall (72) which surrounds the semiconductor device (15);

an evaporation source (17, 19) that generates metal vapor, the evaporation source (17, 19) being disposed within the envelope (2) and outside the first tubular wall (72); and

a second tubular wall (74) which surrounds the evaporation source (17, 19),

the semiconductor device (15) detecting photoelectrons emitted from the photocathode (11) in response to an incident light thereon.

8. The electron tube (1) as claimed in Claim 7, further comprising an insulating tube (9) having one end and another end, the another end being connected to the envelope (2) and the one end protruding inside the envelope (2),

wherein the semiconductor device (15), the first tubular wall (72), the evaporation source (17, 19), and the second tubular wall (74) are disposed on the one end of the tube (9).

9. The electron tube (1) as claimed in any one of Claims 7 or 8,

wherein the envelope (2) includes

a cylindrical base (5); and

a main body (4) having a first main body (4a) that is curved substantially in a spherical shape and a

second main body (4b) that is curved substantially in a spherical shape and that connects the first main body (4a) to the base (5); and

wherein the semiconductor device (15) is disposed on the main body (4) side relative to an intersection (S) between an axis (Z) of the base (5) and an imaginary-extended-curved-surface (I) of the second main body (4b) that is located inside the base (5).

10. The electron tube (1) as claimed in any one of Claims 8 or 9,

wherein the another end of the tube (9) is connected to the envelope (2) and the one end of the tube (9) protrudes inside the main body (4) of the envelope (2), and

wherein the semiconductor device (15) is disposed on the one end of the tube (9).

11. The electron tube (1) as claimed in any one of Claims 8 to 10, further comprising:

an inner stem (80) connected to the one end of the tube (9) via a conductive member (89); and

a conductive member (21) provided on the one end of the tube (9) and protruding outside the tube (9) to reduce the field intensity in the vicinity of the one end of the tube (9),

wherein the semiconductor device (15) is disposed on the inner stem (80).

12. The electron tube (1) as claimed in any one of Claims 8 to 10, further comprising a conductive member (23) provided on the another end of the tube (9) and protruding outside the tube (9) to reduce the field intensity in the vicinity of the another end of the tube (9),

wherein the envelope (2) includes an outer stem (6) connected to the another end of the tube (9), at least a part of the outer stem (6) that is connected to the another end of the tube (9) being conductive.

13. The electron tube (1) as claimed in any one of Claims 1 to 12,

wherein the envelope (2) is applied with a ground potential, and

wherein the semiconductor device (15) is applied with a positive potential.